Name _____ Period _____ Date _____

Part A

Identify each statement as true or false.

1. The bisector of the vertex angle of an isosceles triangle is also an altitude.
2. The diagonal of a rhombus divides the rhombus into two isosceles triangles.
3. If the diagonals of a parallelogram are congruent, then the parallelogram is a rectangle.
4. When you write $\overline{AC} \cong \overline{AC}$, you are using the symmetric property of congruence.
5. When stated in conditional form, the statement "The base angles of an isosceles triangle are congruent" says, "If two angles of a triangle are congruent, then the triangle is isosceles."
6. The diagonals of a trapezoid bisect each other.
7. If a midpoint is needed in a proof, the Midpoint Postulate tells you that you can construct one.
8. The consecutive angles of a parallelogram are supplementary.
9. Postulates are statements you accept without proof.
10. The opposite angles of a quadrilateral inscribed in a circle are congruent.

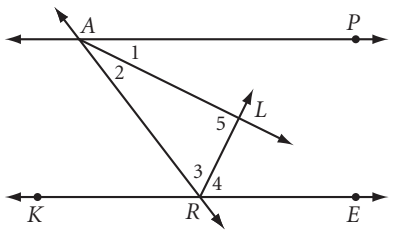
Part B

Provide the reason for each step in the two-column proof given on the next page.

Conjecture: If two lines are cut by a transversal and the rays bisecting a pair of interior angles on the same side of the transversal are perpendicular, then the lines are parallel.

Given: $\overrightarrow{AL} \perp \overrightarrow{RL}$, $\overrightarrow{AL}$ bisects $\angle PAR$, $\overrightarrow{RL}$ bisects $\angle ERA$

Show: $\overleftrightarrow{AP} \parallel \overleftrightarrow{RE}$



(continued)

©2008 Key Curriculum Press

Name _____ Period _____ Date _____

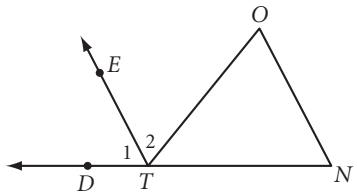
Proof: Statement	Reason
1. $\overrightarrow{AL}$ bisects $\angle PAR$ $\overrightarrow{RL}$ bisects $\angle ERA$	**1.** _____
2. $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$	**2.** _____
3. $m\angle 1 = m\angle 2$; $m\angle 3 = m\angle 4$	**3.** _____
4. $\overline{AL} \perp \overline{RL}$	**4.** _____
5. $\angle 5$ is a right angle	**5.** _____
6. $m\angle 5 = 90°$	**6.** _____
7. $m\angle 2 + m\angle 3 + m\angle 5 = 180°$	**7.** _____
8. $m\angle 2 + m\angle 3 = 90°$	**8.** _____
9. $m\angle 1 + m\angle 4 = 90°$	**9.** _____
10. $m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 = 180°$	**10.** _____
11. $m\angle 1 + m\angle 2 = m\angle PAR$	**11.** _____
12. $m\angle 3 + m\angle 4 = m\angle ERA$	**12.** _____
13. $m\angle ERA + m\angle PAR = 180°$	**13.** _____
14. $\angle ERA$ and $\angle PAR$ are supplementary	**14.** _____
15. $\angle ERA$ and $\angle ARK$ are supplementary	**15.** Linear Pair Postulate
16. $\angle ARK \cong \angle PAR$	**16.** Supplements of Congruent Angles Theorem
17. $\overleftrightarrow{AP} \parallel \overleftrightarrow{RE}$	**17.** Converse of AIA Theorem

Part C

1. Write a two-column proof of the statement below.

Given: $\triangle NOT$ with exterior angle $\angle DTO$ bisected by $\overrightarrow{TE}$, and $\overrightarrow{TE} \parallel \overline{NO}$

Show: $\triangle NOT$ is isosceles



2. Write an indirect proof of the following conjecture: In a scalene triangle, an angle bisector cannot be an altitude. (Remember to draw a diagram and state the "given" and "show" information in terms of your diagram.)

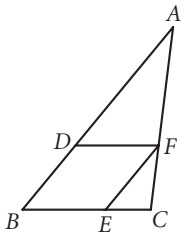
(continued)

©2008 Key Curriculum Press

Name _____ Period _____ Date _____

Mixed Review

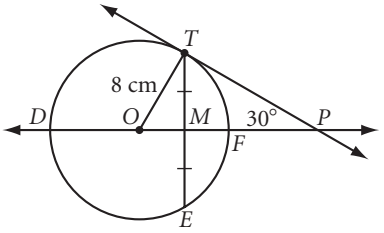
1. *BDFE* is a rhombus, $AD = 18$ cm, $AF = 12$ cm, $FE = 9$ cm



a. $EC =$ _____

b. $FC =$ _____

2. Find the exact length or area.

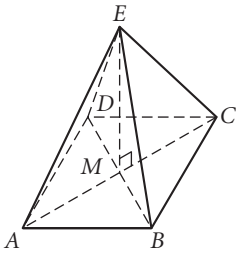


a. Area of $\triangle TOM$

b. Arc length of $\overset{\frown}{TE}$

c. Area of circle segment *TFE*

3. The pyramid shown at right has edge $ED = 13$ cm and altitude $\overline{EM}$. Rhombus base *ABCD* has diagonals $AC = 18$ cm and $DB = 10$ cm intersecting at *M*. Round answers to the nearest tenth of a unit.



a. $AB =$ _____

b. $AE =$ _____

c. Volume of pyramid = _____

4. A guy wire from the top of a radio transmission tower is anchored to the ground 14.1 m from the base of the tower. The wire makes a 67° angle with the ground. To the nearest tenth of a meter, what is the length of the guy wire?

5. For each statement, state whether it is always, sometimes, or never true.

a. An angle is congruent to its supplement.

b. A kite is a trapezoid.

c. The diagonals of a parallelogram are congruent.

d. A triangle inscribed in a circle is a right triangle.

e. The orthocenter of a right triangle is the vertex of the right angle.

©2008 Key Curriculum Press